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THE PRACTICAL TEACHER

A WEEKLY JOURNAL FOR MASTERS MISTRESSES AND STUDENTS

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CERTIFICATE AND SCHOLARSHIP EXAMINATIONS.

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(Specially adapted for Pupil Teachers and Candidates),

By CHARLES MANSFORD, B.A.,

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☛ SEE ALSO PAGE 31.

New Inspection Questions.

[We shall always be glad to receive (in strict confidence) *bona fide* Inspection Questions and Drawing Examinations from our readers.—Ed. *P. T.*]

STANDARD IV.—(*continued.*)

Mental Arithmetic.—

1. How many lbs. are there in 1 ton?	Ans. 2240.
2. How many quarters are there?	Ans. 80.
3. What is a stone?	Ans. 14 lbs.
4. How many pecks in 4 bushels?	Ans. 16 pks.
5. Two stone of potatoes at 1d. per lb.	Ans. 2s. 4d.
6. What change from a sovereign?	Ans. 17s. 8d.
7. Sixty-four hats at 2s. 6d. each.	Ans. £8.
8. Three dozen eggs at 4 for 3d.	Ans. 2s. 3d.
9. How many yards in one mile?	Ans. 1760.
10. How many in a furlong?	Ans. 220.
11. What is half of 21s.?	Ans. 10s. 6d.
12. What is a quarter?	Ans. 5s. 3d.
13. What is a third?	Ans. 7s.
14. Add 2s. 6d., 1s. 3d., and 7½d.	Ans. 4s. 4½d.
15. 14 lbs. of beef at 6d. per lb.	Ans. 7s.

Grammar.—Parse fully:—

'In the spring a livelier crimson comes upon the robin's breast.'

1. How many cases are there in English?
2. How can you tell the nominative?
3. How the objective?
4. How the possessive?
5. What words qualify nouns?
6. How are they compared?
7. What is meant by positive degree?
8. By comparative?
9. By superlative?
10. Compare, little, bad, idle, great.

Geography.—

1. What countries form Great Britain?
2. Name the British islands.
3. Where are they situated?
4. Name the most northern county in Scotland.
5. Where is Wick?
6. For what is it famous?
7. Name three mountains in the north of Scotland.
8. Where is Inverness?
9. In what county is cape Wrath?
10. What channel divides Lewis from the mainland?
11. What are the Hebrides?
12. Which is the land of brown heath and shaggy wood?
13. Where is Arbroath?
14. What is the meaning of Aber?
15. Where is Aberdeen?
16. What is the meaning of Ben, Firth, Burn, Loch?
17. Illustrate each.
18. Name the chief ports of Scotland.
19. Where are they situated?
20. Where is Oban?
21. What point of Scotland is nearest to Ireland?
22. What channel divides the two countries?
23. Name the three longest rivers of Scotland.
24. Mention a town on each river.
25. What are the chief manufactures of Scotland?
26. Where are they carried on?
27. Where is Balmoral?
28. Why is it of note?
29. Name any other places in Scotland where Royalty has resided.

STANDARD V.

Arithmetic.—Boys only:—

1. Find by practice the value of 19 yards, 2 feet, 7½ inches, at 3s. 6d. per yard. Ans. £3 9s. 6¾d.

2. From the sum of ½ and ⅔, take the sum of ¼ and $\frac{7}{12}$. Ans. $\frac{7}{12}$.

3. Make a bill for

	£	s.	d.
109 loaves at 6d. each	2	14	6
200 rolls at ½d. each		8	4
30 cakes at 1s. 6d. each	2	5	0
20 lbs. of sugar at 3d. per lb. ...		5	0
60 lbs. of biscuits at 6d. per lb. ...	1	10	0
Ans.	£7	2	10

4. A man bought 12 pieces of linen for £77 10s., at the rate of 5s. 2d. per yard. How many yards did each piece contain? Ans. 50 yards.

Arithmetic.—Girls only:—

1. Make a bill for

	£	s.	d.
10 lbs. salmon at 10d. per lb. ...		8	4
12 rabbits at 2s. 6d. each	1	10	0
14 fowls at 5s. per pair	1	15	0
18 ducks at 7s. 6d. each	6	15	0
Ans.	£10	8	4

2. How many yards of silk can be bought for £136, when 63 yards cost £12½? Ans. 672 yards.

3. Find the value of ½ + ⅔ − ¼. Ans. $\frac{17}{20}$.

4. A piece of ribbon measures 15 yards 6 inches. How many bonnets could be trimmed with 12 such pieces, supposing each bonnet to require 2 yards? Ans. 91 bonnets.

Composition.—'Too much and too little.'

Two, friends who had not met each other for some time, chanced to meet again, and so greatly had they changed in appearance that at first they did not know each other. During these years one of them had grown very stout whilst the other, who had just recovered from an illness, was very slender and pale. When at last each had recognised the other, the stout gentleman said, 'Why, Dick! you look as if you had not tasted a dinner since I saw you last.' 'And you,' replied the slender one, 'look as if you had been at dinner ever since.'

Dictation.—(Previously unseen):—

With steps more faltering and unsteady than those with which she had approached the room, the child withdrew from the door and groped her way back to her own chamber. The terror she had lately felt was nothing compared with that which now oppressed her. The grey-headed old man gliding like a ghost into her room, and acting the thief while he supposed her fast asleep, then bearing off his prize and hanging over it with the ghastly exultation she had witnessed, was worse than anything her wildest fancy could have suggested.

Grammar.—

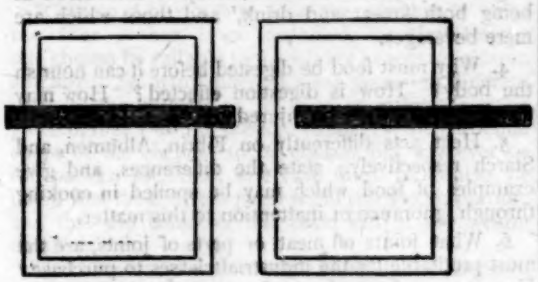
1. Analyse and parse:—'England expects every man this day will do his duty.'
2. What is a sentence?
3. What is the subject?
4. What is the predicate?
5. What words govern in the objective case?
6. Point out the transitive verb in the sentence given.

Teachers' Notes of Drawing Lessons for Standard I.*

By an Art Teacher under the London School Board.

IV.

Rulers.—If the rulers for Standard I. were short enough to lie across the slate without resting on the frame it would be an advantage; if 12 inch rulers and framed slates are used the children must be taught to place *both* ends of the ruler on the frame, and not one end on the slate and the other on the frame.

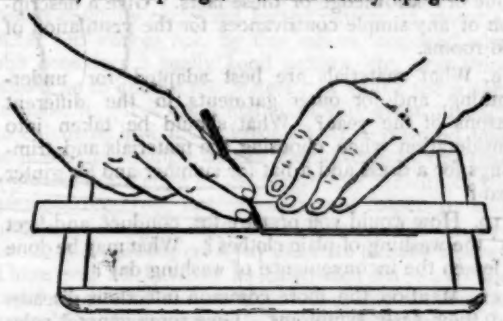


Right. Wrong.

Position of Ruler.

At the same time they will learn to use the *middle* instead of trying to start their line at the *end* of the ruler.

The fingers of the left hand should hold the ruler firmly in the middle, pressing it down (it will bend a little, but that cannot be helped unless unframed slates are used) and the line should be drawn from left to right along the edge of the ruler farthest from the child, the 'top edge.' Pencil nearly upright.



A careful watch must be kept to prevent the formation of awkward or slovenly ways of using the ruler. Bad habits of that kind are much more easily prevented than cured.

Some children find a difficulty at first in keeping the pencil touching both slate and ruler while they draw a line, and many will patch up their ruled lines with bits of freehand.

Exercise.—1. As in Lesson III., but with rulers.

2. The same, but slates long-ways.

Note—This work would be better done if the desks in nearly all schools were several inches lower.

* The Teaching of Drawing becomes compulsory on September 1st, 1891. These articles will be specially helpful to teachers who know but little of the subject. They will teach them how to teach it successfully.

V.

Names of Position.—(Rulers.)

Show that the line (1) is *level* like the *floor*.

" " (2) " *upright* " *walls*.

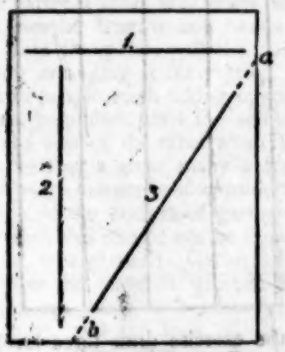
" " (3) " *slanting* " *roof*.

Get as many other comparisons as possible, but leave the technical terms alone for the present.

Top and bottom of board are level—line (1) is parallel to them.

Sides of board are upright (put it so), line (2) is parallel to the sides.

Line (3) is not parallel to the side because it will meet it (*a*), nor to the bottom, which it will meet at (*b*).



Exercise.—Level and upright lines with rulers.

Draw level line across the middle.

" between top and middle.

" between middle and bottom.

Count three parallel level lines.

Draw upright line down middle.

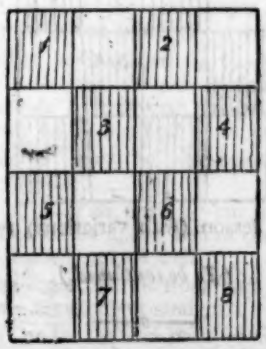
" between middle and left side.

" between middle and right side.

Count three parallel upright lines.

Fill up in this order—1, 2, 3, 4, then 5, 6, 7, 8.

'What does it look like?'



VI.

(Without Rulers.)—*Upright lines* will be found much more difficult than level lines. In this lesson particular attention should be given to them, especially in pointing out and correcting the prevailing tendency to slant downwards to the left.

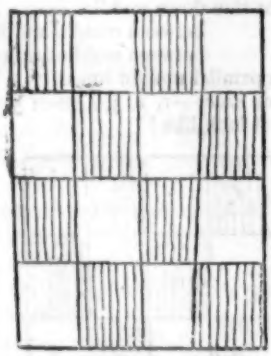
The teacher should constantly, in his drawing on the board, make the errors which he wishes to correct in the children's work. Lines to be copied freehand must never be drawn on the board with a ruler.

Draw a line down the middle of the board, letting the class tell as it goes on:—

'What kind of a line? Where is it going? Is it going straight down? Slanting which way, to right or left?' keeping them watching for any deviation from the straight, altering as the line progresses, and being very careful about the last bit. See this line on the slates before proceeding. In (2) the side of the slate will be of great use as a guide—the upright line must not be allowed to go nearer, but keep the same distance all the way down. In (3) the same fault will tend to carry the line farther away from the side.

To finish the exercise draw three level lines and complete as in lesson 5, but without rulers.

Mark in coloured chalk—then select and show to class some slate on which a slanting line puts the figure all out of shape. If it is a window, what sort of panes are these at the bottom?



Repeat this lesson (with variations) two or three times.

(To be continued.)

—o—

Occasional Examination Papers.

THE following set of questions on the Laws of Health and Domestic Economy was given at an examination of selected girls from London Board Schools in the year 1890. The candidates were allowed to choose not more than seven questions out of the eleven on the paper; and the time allowed for the exercise was three hours.

The questions may serve to indicate the range of knowledge required to pass the examination, and may afford teachers a means of applying a test to their own classes in the subjects.

1. Explain the term 'Domestic Economy.' What subjects are embraced in the study? What are the conditions necessary to secure good health?

2. What are the purposes served by food? What food stuffs are adapted to serve these purposes? Which food do you consider the best for the growing period of life?

3. Why is it necessary to take liquid foods? Distinguish between those which may be considered as being both 'meat and drink,' and those which are mere beverages.

4. Why must food be digested before it can nourish the body? How is digestion effected? How may the digestive organs be injured?

5. Heat acts differently on Fibrin, Albumen, and Starch respectively; state the differences, and give examples of food which may be spoiled in cooking through ignorance or inattention to this matter.

6. What joints of meat, or parts of joints, are the most profitable for the industrial classes to purchase? How can such portions of meat be cooked so as to make a palatable and economical meal?

7. Prove that if dirt is allowed to remain on the skin for any length of time the health of the individual will suffer. How can cleanliness of the person be best secured? What arrangements may be made in an ordinary dwelling to lessen the inconvenience arising from the absence of a bath-room?

8. What purposes are served by breathing? How is the operation effected? What changes take place in the air while passing through the lungs? Show the value of a knowledge of these facts. Give a description of any simple contrivances for the ventilation of bed rooms.

9. What materials are best adapted for underclothing, and for outer garments in the different seasons of the year? What should be taken into consideration when choosing the materials and trimmings for a dress and a hat for summer and for winter wear?

10. How would you prepare for, conduct, and 'get up' the washing of plain clothes? What may be done to lessen the inconvenience of washing day?

11. Mention the more common infectious diseases and their early symptoms. Give some general rules for the nursing of patients suffering from scarlet fever.

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Needlework for Pupil-Teachers.

BY MISS SOPHY LOCH,

Examiner of Needlework to the London School Board.

PUPIL-TEACHERS in their first year are required to show to H. M. I. on the day of examination—

1. A chemise or a nightshirt, showing all the stitches required in Standards IV. and V.

2. A hole correctly mended (common method) in stocking material.

3. Paper patterns (cut out and tacked together) of two garments suitable for children in Standards III. and IV.

4. A sock.

If the pupil-teacher allows herself two hours or so good steady work a week, she will easily get through her syllabus, including the practice of the exercises to be given on the day of examination itself.

I will speak first of the garments which have to be cut out and made up, and will suppose the chemise has been chosen as the one to show the various stitches required.

First choose the pattern.

It seems a pity not to turn the garment to some use after it has been inspected, therefore let the one chosen be suitable to the worker as regards pattern and size. So many different ideas prevail in different parts of the country as to what constitutes a good pattern, that I do not propose to suggest the particular shape of the chemise to be chosen, but whatever be the pattern preferred, due care must of course be taken that the different parts are in relative proportion, and that the band for the neck will fit the wearer comfortably.

There are many excellent little manuals and diagrams published now which are not costly, and which might help those who have not had much experience in cutting out. Among the newest are Mrs. Grenfell's 'Diagrams for cutting out underlinen,' aod Miss Heath's 'Pattern making by paper folding,' published by Messrs. Longman. (Should the pupil teacher or her friends possess an old chemise which is comfortable and well cut, it is a good plan to unpick it and cut from that.) I will now suppose the shape and size of the proposed garment has been settled; but before thinking of cutting it out in material, three or four full-sized patterns should be cut out in *paper*, to be tested carefully each time by the pattern in material. After the worker has, by this means, acquired what she considers a really good pattern, the next thing would be to choose the material of which she wishes to make it. It is not a matter of very great difficulty to calculate how many yards of calico it would take to make the chemise, as she should have by this time a perfect knowledge of the length and breadth of the garment required, but she must not forget to take into consideration that the chemise will require bands and possibly crossway pieces to line the sleeves. These will all have to be calculated for; also the *width* of the material must be taken into account, as it would be very wasteful to get the widest calico for a very small chemise, though for a large-sized garment it would be required. I would suggest that the garment should form one of a set of four or six to be made up for future use afterwards, and enough calico be bought for that purpose, taking thought that the bands, etc., must all be cut the right way of the material. With regard to the *kind* of calico to be bought, it should be remembered that cloth with what is called 'dress' in it is much to be avoided, as it is both difficult to work and bad in wear, and that, as the work is for examination, the self-edges should be perfectly fresh, clean and even. A cloth of *even* texture, not too closely woven, wears and washes the best. When buying the calico, it is well to buy also at the same time needles and cotton to work it with. No. 60 cotton for the seams and hems, No. 40 and 50 cotton for the gathering and buttonholes, and No. 8 needles would be I think suitable for working on ordinary calico. Cotton which has been lying by for some time should not be used, as it is liable to become dry and brittle as well as soiled.

These materials being now bought, and the paper pattern ready, the next thing to be done is to measure off in the calico double the length of the paper pattern, making due allowance for hems at bottom, and tear off the chemise lengths, first taking off the bands, should they be required to come off the sides of the calico. Should the chemise be gored at the bottom, the little gores might come out of the material left after the sides are sloped. Unless great economy is required, self-edges should always be torn off, even in bands, as the garment looks very much better without them. The chemise lengths and bands being now torn off, the next thing is to pull the calico perfectly straight before arranging it for cutting. This must be done by two people, each taking opposite corners, and they must be pulled until the self-edges can lie flat one on the top of the other when the calico is folded. (In cutting a great many garments, where the saving of every minute is of consideration, calico is cut, not torn, at the bottom of garments; but for examination work this should not be done, unless the material is *cut to a thread.*) Garments which have been cut across the material, without having been pulled straight, are liable to become crooked after the first washing, and the look of the garment is spoiled. The material then having been pulled straight, and folded in half along the top, the paper pattern must be pinned on, paying attention to turnings, if they have not been included in the paper pattern. Laying the hand down flat on the pattern and material to keep it firm, the material must be cut with the scissors held in the proper way, viz., with the sharp point downwards. The armholes and sides are first cut (I am supposing the sleeve and body of garment are cut in one), and then the slope for the neck. The shoulders are of course double. The principal points to be observed are—

1. Always cut from the *same* paper pattern, not using one chemise to cut another.

2. If it cannot be managed to cut through four thicknesses of material at the side (which is generally done), cut one side first, reverse the pattern, and cut the other. Only be certain both sides are alike.

3. The material must be cut smoothly, not in notches.

4. Half an inch or so must be cut straight down from the point of the shoulder, before curving for the neck, or the band will not set well.

5. The *middle* part of the front and back of the neck of chemise must be cut straight.

6. A 'hook' under the arm must be avoided, great care being taken with the curve.

7. A little more than double the width of the bottom hem must be left straight at the side, so as to allow the hem to lie flat.

8. The front slit for the neck need not be cut or torn down till after the sides, &c., are done.

The chemise is now cut out ready to be tacked and made up. A garment well tacked is half made, therefore great pains must be taken with it. The sides are first tacked for sew and fell seams, care being

taken to make the seams face each other; in other words, the front of the chemise is turned down *twice* on both sides. This makes the front width of the garment a trifle smaller or narrower than the back width, which is of necessity turned once only. In *working* the seam, the cotton should be left a little slack in going round the curve; as otherwise, when the garment is washed, the cotton will be apt to break through shrinking a little. The bottom hem must be carefully turned, tacked, and hemmed, the seams lying straight at the sides. The seaming and hemming stitches need not be very *small*, but great attention must be paid to their regularity and proportion, also to the strength and neatness of the fastenings on and off. The hemming and seaming stitches should match each other in point of size.

(To be continued.)

An Object Lesson.

BY JAMES BAILEY,

Head Master, Southlands Training College, Battersea.

BRICKS, AND BRICK-MAKING.

As nearly as possible the italicised words indicate answers to questions.

[For illustration of the lesson, the various things referred to should be at hand. Bricks of various sorts, clay, moist, and dried, &c.]

I. THE BRICK.—Show a brick, deal with it as with objects generally, bringing clearly out its qualities, properties, &c., as they may be discovered by the eye and the hand; especially note:—

1. *Its Shape.*—Let all look carefully at the brick to see its *shape*. It has a number of *sides*. How many are there? Count them. It has *six sides*. But the sides are not all of the same *size*. Two are *larger* than the others, two are *smaller*, two are of *middle* size. We give different names to these. The two larger are the *sides*. The two smaller are the *ends*. The two middle sides are the *edges*. Repeat these names as teacher touches them. How many of each? How many altogether? Look again at the sides. Though a little *rough*, they are *even*. What may we say of them? *The sides are flat.* Name other flat things. Things that are not flat. (Give a number of the class opportunity of doing this, till the idea of flatness is clear to all.)

Because it is flat see how it lies on the table, or one upon the other. The *brick lies steady*. Try a marble, a ruler, a flower-pot on its sides. What is the difference? Why will they not lie still on each other?

Look again at the sides. See how one side meets the other. What do we call this? What kind of edge is it? *Long, straight, like a line.* How many such edges? See where one edge touches another at their ends. What do they make? A *corner*. Another name for corner? Refer to lesson on form. These are *angles*. How many are there?

(Revise at this point *names, numbers, position*, &c., summing up in a few short simple sentences.)

2. *The Colour.*—The common brick is *brown* or *yellowish*. There are *red bricks, white bricks, bluish* or *slate-coloured* bricks. Some are *white* and *smooth*, and *shining* like glass. Show specimens of these if possible.

3. *Other qualities.*—By a like process of carefully directed observation, questioning and explanation, show that a brick is *hard, heavy*, and *solid*. For this quality compare with a pencil box or chalk box. Its size and shape are much alike. But the box has only *sides* and *ends*, it is? *hollow*. The brick is the same all through, it is? *solid*. Make this plain by other illustrations. Ask for other solid things, for things not solid. (Revise as before.)

II. BRICK-MAKING.—Show a piece of hard clay. In what is it like the brick? In *colour*, in *hardness*, &c. In what is it not like the brick? In *shape*. What is the difference? Which is the harder? But the brick was once a piece of clay. How did it get its shape? and its hardness? To know this let us look at a piece of *soft clay*. In what is it like the hard clay? In *colour*, in *heaviness*, &c. In what does it differ? It can be *squeezed into any shape;* it can be *easily pulled apart*, &c. What makes the difference? The *hard clay is dry* throughout; the *soft clay is wet*, moist throughout. The brick was once a piece of soft clay. But how did it get its shape? It was not cut or chopped into this shape. Illustrate this by pressing the soft clay into a pencil box. What is its shape now? Show by carefully putting it out on a slate. It is now *like a brick*, but *soft*. How can it be made hard? The hard piece of clay will show this. *It must be dried.* But will water make the dried clay soft again? *Yes* (show this by putting dry clay in water). Will water soften the brick? Try it; it cannot be softened again. How is this? Explain that the brick was not only *dried* but *burnt* in a fire. We have learnt then that *dried clay may be made soft in water; burnt clay cannot be made soft in water.*

Let us now say what we have learnt about the brick. *A brick is made of clay. The clay is soft when wetted.* The soft *clay is dried.* The *dried clay is burnt.* (Revise carefully).

III. WHERE AND HOW BRICKS ARE MADE.—Describe a brickfield. The large open space; the *clay pit* at one side of it; the *digging* of the clay out of it; the mixing with sand and water; the *grinding* it small by the great wheel kept turning round over it; the lads taking the lumps of clay to the workmen; the long tables they work at; the pushing the soft clay into the *moulds* like pencil boxes; the long rows of soft bricks laid to dry in the wind and air; the piling them up when dry in heaps to be *burnt*, or putting them into the *brick-kiln*, a kind of great oven; the great fire kept burning for days together, &c. Ask the reason of each step of the process by reference to former part of the lesson.

IV. THE USES OF BRICKS.—What are they used for? For building *walls, houses, bridges.* Some for *pavements*, &c. Question well as to where seen? How put together? The man who builds with them is? *A bricklayer.* How fastened together and kept in their place? By *mortar*, &c. The even neat rows in the firm-built walls, &c. (Revision as before.)

As the lesson proceeds, short simple sentences summing up the main points may be written, if expedient, as a

BLACKBOARD SKETCH.

A Brick has six sides.

Two sides wider, two narrower, two smaller.

The sides are flat with straight edges.

Bricks are made of soft clay.

The soft clay is dried, then burnt.

A burnt brick will not get soft.

Bricks are used to build walls and houses.

(To be continued.)

—o—

Publications Reviewed.

Annotated English Classics. Shakespeare's History of King John, with Introduction and Notes, Explanatory and Critical. By the Rev. Henry N. Hudson, LL.D.

Shakespeare's Tragedy of Coriolanus. By the same. Boston: Ginn and Co.; London: Edward Arnold.

These are neat handy volumes edited by the best known of American commentators on Shakespeare's plays. The first volume contains a most interesting paper, addressed to teachers, on 'How to use Shakespeare in Schools.' Written in a characteristic style, fairly sprinkled with Americanisms, and appearing at the outset to exhibit that reverence for the 'almighty dollar' for which our Transatlantic cousins are proverbial, this essay turns out to be full of practical common-sense, and the work of an independent yet loving critic of the great dramatist. He would have the study of Shakespeare 'a pastime, a recreation, a delight.' Hence he does not approve of the merely verbal criticism and linguistic discussions which form so large a part of what passes for Shakespearian study, and too often bores and disgusts the young student. It is for the poetry of Shakespeare that he would have his works studied, and the foundation of his method of study is the endeavour to make the lives of his pupils happier, wiser and better. He has some strong but sound remarks on what he calls 'the idolatry of intellect'—'the prating and pretentious intellectualism which we pursue with such suicidal eagerness.'

The introductions show much independence of thought and vigour of expression. They deal with such subjects as the historical basis of the plays, the deviations from history, the chief characters. From these every reader may gather much that is pleasantly instructive.

The explanatory notes are placed at the foot of the pages, and serve to make clear allusions and archaic and peculiar expressions. They are not very numerous, but seem well fitted to serve their purpose.

Critical Notes are preserved for the end of each volume, where we find the various readings and emendations briefly stated and discussed.

Public Education in Cheshire. By John T. Brunner, M.P., and Thomas E. Ellis, M.P. Manchester: John Heywood.

This little volume, ushered in with the names of two active members of Parliament, has no preface or introduction. It consists practically of an exposition and an appeal—an exposition of the present possibilities of public education under recent legislation, and an appeal to the public spirit of the County Palatine to avail itself to the full of the advantages the law has placed within reach of the people. Much of the matter is compiled from official documents. Thus the provisions of the Technical Education Act of 1889, and the Local Taxation Act, 1890, the salient points of the New Education Code, a summary of the laws relating to Public Libraries and Museums, form the substance of several chapters. Others abound in statistical tables relating to the position of education in the county. Information is drawn from all sorts of quarters,—from reports of various educational systems both at home and abroad. The object of the authors, who show themselves to be able men, full of enthusiasm for popular education, is to secure the practical adoption by the local authorities of all the means for extending and improving the education of Cheshire, so that it might 'take the lead among the counties of Britain.' We may wish success to their efforts, and at the same time hope that a like ambition on the part of other districts with like-minded leaders may make the task of the Cestrian folk by no means easy. Among the proposals of the authors we note with pleasure the formation of a Council of Education and the recommendation that teachers, both of elementary and higher schools, shall be represented on it. The work is well worth reading by people in Cheshire and elsewhere.

Object Lessons from Nature: A First Book of Science. By L. C. Miall. London: Cassell and Company.

Professor Miall has produced a book which deserves the warmest of welcomes from teachers and, indeed, from all who wish to see the elements of science taught on a rational plan to school children. The twenty-six lessons here presented are very different from those we are accustomed to see in ordinary collections of 'Notes of Lessons.' The author has gone to Nature for his knowledge, and he endeavours to bring Nature to his pupils. The facts respecting quadrupeds, birds, fishes, insects, and other animals, flowers, and fruits, and common natural objects and phenomena, are very abundant, and are so presented as to stimulate the observing and reasoning faculties. The lessons are intended to be read aloud, we presume, by the teacher; for the cost of the book, though its price is very moderate, would be an obstacle to its introduction as a class book for pupils in most elementary schools. The reading, however, must not be formal and continuous, if the full advantage is to be derived from the lessons. Actual objects must be at hand, and must, as far as possible, be constantly referred to. The knowledge to be imparted has in most cases been evidently gathered by the personal observation of the author, and it is by appealing to the direct personal observation of the children that the teacher will effectively inculcate the lessons this book will enable him to teach. The objects and apparatus required to illustrate each lesson are indicated at the beginning or mentioned in the course of the lesson. In towns it will probably be found difficult to secure all the specimens that are desirable, but the guidance of Mr. Miall will help the teacher to make a judicious selection. Many of the lessons will require subdivision for use in classes of children. The work is eminently readable, beautifully illustrated, and highly suggestive. As examples of the presentation of scientific information in a charming style we may specially refer to the lessons on 'The History of a Summer Shower,' and 'The Course of a River.'

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SOME teachers are unbusinesslike. Consequently all the subscriptions to the N. U. T. for 1890 have not yet reached the treasurer, and it is impossible to say what the membership for the year will be, though it is certain that there will be a substantial growth. This proves what the whole history of the Union has proved—that an increase of subscription is followed by an increase of numbers. It is not that teachers, unlike other people, are fond of paying away money, but they feel that the greater power which comes from greater resources makes the Union better worth belonging to. A weak Union is dear at any price, and when the advantages of joining have become so clear that even the short-sighted must see them, and even the selfish must think them a profitable purchase, there will be no cause to lament the number of outsiders.

***

AT the first meeting of the Executive this year a very difficult question was discussed at some length. It seems that a master, exercising the power given by the New Code of placing every child in the class best suited for it, had been censured by the School Board, in whose employ he was, and been ordered in an offensive manner to put up again certain children whom he had put down. He appealed to the Executive for advice, and was given to understand that if he resigned he might come upon the Sustentation Fund. If the teacher is to have no voice in the classification of his school, managers may cheat exceptional pupils out of the right to exceptional treatment conferred upon them by the Code. On the other hand, if the managers are to have no voice, the whole theory on which the relations of the State to the school are based will be upset, and large School Boards will be unable to make regulations for securing uniformity of action. Reasonable managers choose discreet teachers and trust them. But when managers are unreasonable or teachers indiscreet?

***

IT need hardly be said that the Board concerned in the case just mentioned was a small one, hor that we heartily approve of the motion which the Executive has resolved to place on the Conference Agenda, 'in favour of making the areas of all School Boards to correspond with those of the administrative counties of the country.' There are in England and Wales 115 School Board districts with less than 250 inhabitants—inhabitants, not ratepayers—414 more with less than 500 inhabitants, 349 more with less than 750, and 221 more with less than 1,600. Thus out of the total number of School Board districts (2274) there are 1642 with less than a thousand inhabitants each. In such districts the number of persons qualified to direct the education of the young is necessarily small, and School Board members must often be chosen, not from amongst the most fit, but from among the least unfit. With larger areas there would be a larger field of selection, members of higher standing would be secured, while economy and efficiency would alike be promoted by the organization and co-operation which larger areas would render possible.

***

THE numberless stories told of the ignorance, narrow-mindedness, petty spite and caprice of small School Boards would be incredible if they were not well authenticated. Mr. Macnamara told one at the last Conference. The quarrels between the members and the clerk of a rural Board in the West of England grew so violent that the Education Department was appealed to, and an inspector was sent down to compose the differences. One of the members when asked to explain the causes of dissension, began, 'You see, sir, we ain't been satisfied with our clerk 'ere for a long time past, so at last I ups and writes to——.' 'That's a lie' shouted the clerk, 'for you can't write.'

***

THE Master of the Rolls expressed a pious wish the other day that one half of England would not libel the other half. To judge from the reports of the Law Committee of the Executive, the libelled half consists mainly of teachers. The first report presented this year mentioned three cases that had been closed, one by a verdict in favour of the teacher, the others by ample apologies, and the next report gave details of fresh cases. The same documents showed what steps had been taken to punish persons guilty of assault upon teachers. No one who reads the proceedings of the Executive can doubt that the Union is worth belonging to, or that the British constitution is tottering when teachers cannot be kicked and slandered with impunity.

***

AN abstract of the Superannuation Bill prepared by the Executive has now been published. The Bill provides that the Education Department shall deduct from the grants 4 per cent. of the salaries paid to all certificated teachers, and that the salary of each teacher shall be paid subject to the deduction. Males are to be entitled at 60 and females at 55 to a pension equal to as many sixtieths of their retiring salaries as they have completed years of service. The solvency of the fund is to be guaranteed by the State. That a system of pensions would be directly a great boon to teachers, and indirectly a great benefit to education is unquestionable. Hence it is to be hoped the government will accept the Bill. With a 4 per cent. deduction the responsibility of the State must be

utterly insignificant—unless, indeed, the older teachers are to be allowed to come almost at once on a fund towards which they have contributed little or nothing. Even then the fund would fall short of the demands upon it only for the first few years, and a strong case could be made for the generous treatment of men and women whose valuable services to the commonwealth have been very inadequately remunerated.

A Course of Object-Lessons and Elementary Science.

(Adapted to the Syllabus of the New Code and of the London School Board.)

BY RICHARD BALCHIN.

Head Master under the School Board for London.

'THIRTY object lessons,' says the Code of 1891, 'should be the year's work of Standards I. and II. in the class subject "Elementary Science."' We find in the 'Supplement to Schedule II.' seven specimen sets of objects, of singular variety. A pair of bellows, a carrot, a red-hot poker, and an earthworm figure in the list. We are further officially informed that the last named object should, on agricultural grounds, be treated with kindness and care, and we shall be amply repaid.

It is evident that the teacher is at liberty to prepare his own syllabus, and submit it to H. M. Inspector, who, I have found, will always pass it, provided the course is graduated and reasonably adapted to the successive stages in the growth of an ordinary child-mind.

In last week's *Practical Teacher*, I gave the outline of such a scheme, and explained the principles upon which it is based. A proper perception of things, is the especial work for Standard I. We will begin with:—

THINGS IN OUR HOME.

Here, according to the almost unanimous testimony of the boys themselves, the most important thing is 'money.' Because, as one of the boys significantly observed, 'if there wasn't no money, there wouldn't be nothing else;' so instinctively accurate, though dim, is the perceptive faculty of even a first standard mind.

1. For a lesson upon 'MONEY' the following illustrative objects are required:—

Specimens of the various coins, some foreign coins, a few cowries, and a Bank-note.

Notes. Few people in the world make all the things they require. Most exchange what they *do* make for other things required, but which others make. Exchange effected by (1) barter, or (2) agreeing upon something as a medium. Money is the medium. Why does a boy's father work? In order to live and that his family may live. He works for money. Why money? He cannot *eat* money, nor *wear* money. What does the boy's father work at? Carpentering. He makes a table. But he cannot eat the leg of a table He wants the leg of a sheep. Well, he sells the table for money, and for the money, the butcher, who does not happen to want a table, will let him have a leg of mutton. Gold, silver, and bronze are metals used in England as money. 'Coins,' the name of the pieces of metal so used. 'Coining,' the making of coins. 'Mint,' the coin factory. The 'Sovereign' consists of pure gold with a little copper to make it hard. One pound weight of pure gold goes to make forty-six sovereigns. Bronze is a mixture of copper and tin. A Bank is a place where for safety and for profit people keep their money. The Bank of England is the place where the Government keeps its money, *i.e.* the taxes; whence it is taken to pay for our army, navy, Queen, princes, prisons, education of the people, etc. A Bank-note is not money, it is a printed promise of the Bank to pay money. Read what the Note says. Finish up the lesson with a description of the Post Office Savings Bank. Show how easy it is for boys to save some of their pennies. Show the boys a Savings Bank depositor's book; also the slip for penny stamps; and urge 'thrift.'

THINGS IN OUR HOMES:—FOOD.

2. *Bread.*—Show specimens or pictures of wheat, barley, oats, flour, and of a bakery. Explain all the various steps, of course in a conversational manner, by which the grains of wheat become the loaf of bread. Show the grains of wheat, and by their side, on the table, place a loaf of bread. Preparing the land; sowing; reaping; grinding into flour; show some flour; making dough; baking bread. Butter, or treacle, good with bread; bread for renewing waste; treacle or butter for giving heat. Best bread is not the whitest. Adulterations of bread. Brown bread.

3. *Meat.*—Show pictures of sheep, oxen, pig, fowl, fish.

Meat is heat-giving, and body-building food. Three varieties, viz., beasts, fish, and birds.

(1.) Beasts: ox—beef; sheep—mutton; pork—bacon ,ham; veal and lamb.

(2.) Fish: (*a*) Fresh or river fish—eels, salmon. (*b*) Salt or sea-fish—herring, cod, plaice. Most of the boys have seen a fishing fleet at the sea-side. Talk about it. Hardship of fishermen in the winter: awaken sympathy.

(3.) Birds: Birds of prey not eaten; ex., vulture, eagle. Eatable birds—Fowls, geese, turkeys, etc.

4. *Vegetables.*—Much meat not necessary, especially in the case of children. Should have plenty of vegetables. Note the different parts of the plant which are eaten, thus:—(1) Foliage or leaves—cabbage, greens, spinage. (2) The leaf-stalk, as rhubarb. (3) Seeds, as peas and beans (*i.e.* haricots), rice. (4) Seed cases, as French beans and scarlet runners. (5) Roots, as turnip, carrot, radish. Note other parts of the plant which are eaten; ex., potato, an underground stem; cauliflower, a bunch of blossoms. There is a large amount of food-material in seeds. It is said that a half-pound of peas-pudding contains as much nourishment as two mutton chops.

5. *Fruits.*—A very necessary summer food, but must be ripe and fresh: give a caution against buying halfpenny-worths of rotten fruit. Fruit not a heat giver. The 'fruit' of a plant is generally the seed-case fully grown. Ex., the orange, lemon, melon, apple, pear, plum, fig, gooseberry, and grape. Show

this by a specimen. Note the various drinks made from fruits, ex., cider from apples; perry from pears; wine from grapes.

6. *Drinks.*—Specimens, etc., required: a glass of water, a glass of beer, boiling tube and spirit lamp, specimens of tea, coffee, etc. Before any solid food can become a part of the body it must be dissolved. Digestion is the process by which all solids are completely dissolved. Water is the natural drink. All others are water and something else. Spirit drinks are beer, gin, wine, rum, etc.; boil one of these and light the spirit. All these spirit drinks are really various forms of adulterated water, or they are medicines. Drinks without spirit (infusions)—tea, coffee, cocoa, etc.

Note.—Separate lessons may be given upon tea, coffee, cocoa, etc.

7. *Milk.*—Show pictures of milking, and of a farm dairy, churn, etc. A glass of milk. Milk is the most nourishing of all drinks, it is liquid drink and solid food. Put some 'rennet' into a test tube of milk. Note the result, curds and whey, explain the process of cheesemaking. Cream and skim milk. The making of butter.

THINGS IN OUR HOMES:—FURNITURE.

8. *Articles of wood and of iron.*—Show specimens of pine, mahogany, and oak, and pictures of the trees; also specimens of cast and wrought iron. Kitchen-dresser, pine wood, white and soft, and light: easily worked. Other pine, such as pitch-pine, probably the kitchen table, if not, call attention to the school desks. Describe the fir-tree; mahogany, Spanish and Honduras; oak, beech, larch, etc.

Articles of iron—cast iron, ex., the fire-grate; wrought iron, the poker, etc. Show picture of a blast-furnace and briefly explain the process of iron smelting. Steel and articles of steel.

(To be continued.)

How to Teach School Children to Sing from the Staff Notation.

BY W. G. McNAUGHT,
Associate of The Royal Academy of Music.

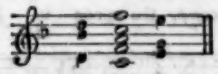
DIVISION III.—SONG TEST.

CODE REQUIREMENT.

To sing in unison in good time and tune, and with due expression, a school song set to words. A round may be offered instead of a song. These are the English regulations. The Scotch add '*that two part-songs may be offered.*'

92. These requirements represent apparently only a slight advance on those for the previous Division. But properly interpreted they should be understood to call for a considerable advance in the style of song and refinement of delivery. There is great danger, especially in a Staff notation course compared with a Tonic Solfa course, to so completely absorb the time in studying the numerous facts of music and minutiæ of notation which should somehow be taught at this stage, that the proper study of songs may be crowded out. But this should not be so. Songs carefully selected and rightly taught provide apt and pleasant illustrations of the theory and notation taught. It saves no time at all to give an unimportant place to songs.

93. How should songs written in the staff notation be begun? First, it is rarely desirable that they should be read in time and tune at sight by the whole class. This, if attempted in an average class, will almost certainly result in great fumbling and stumbling, and the committal of many errors that the memory will retain. The whole song should be performed to the class as perfectly as possible. This interests the class because they feel the rhythm and melody, and now they know they are to learn a real piece of music. Then the place of the *doh* on the staff should be settled, and it will be well if a voluntary be pointed on a blackboard staff on which the key chord and other tones are written, say as follows:—



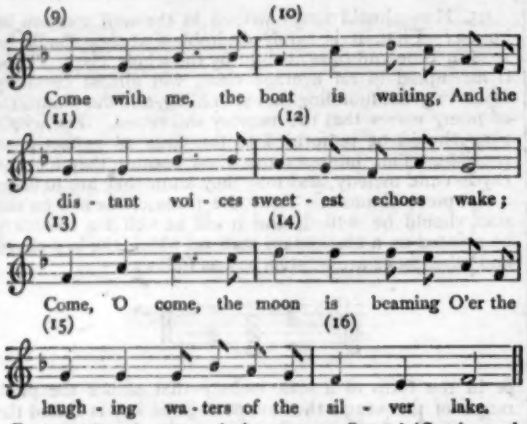
or in the form of a scale-melody that shows the pitch range of the song; thus supposing the key is F and the song ranges from low C to D on the fourth line, the blackboard will appear as follows:—

This will pave the way for the correct solfaing of the tune. The next step should be to teach phrases of the tune by pattern. The teacher sings alone to the proper solfa syllables while pointing on one of the staff diagrams suggested above, and the class imitates while the teacher silently re-points the phrase just patterned. This process should be repeated several times until the class is fairly familiar with the phrases. The copies of the music should now be studied. It is presumed that each child has a copy. As the printed copy presents the tune quite differently from the pointing on the blackboard it should now be again taught phrase by phrase from the book. The time should next be attentively studied. For this purpose the blackboard should be utilised. The time signature should be shown and commented on, and a specimen of every variety of bar-filling exhibited. As most songs have a great deal of rhythmic imitation this will not as a rule involve much writing; and at the same time the demonstration of likenesses and unlikenesses will powerfully impress the eyes of the pupils, and accustom them to look not so much at this note and that note, but at groups of notes. Take for instance the following tune—

THE SILVER LAKE.

Moderato.

☞ **Miss Scott's Scholarship Answers will be resumed next week.**


(9)
(10)
Come with me, the boat is waiting, And the
(11)
(12)
dis - tant vol - ces sweet - est echoes wake;
(13)
(14)
Come, O come, the moon is beaming O'er the
(15)
(16)
laugh - ing wa - ters of the sil - ver lake.

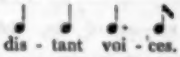
For two-part arrangement and other verses, see Curwen's 'Crotchets and Quavers.' Part II. Price 3d.

the analysis on the blackboard will be as follows :—

and it will be plainly seen that there are only four varieties of bar-filling throughout the tune. Of course, the pupils themselves should discover these varieties and their repetitions. The above analysis should then be used as a time exercise, sung on a monotone to time-names or to laa, sometimes straight through as written, and sometimes in irregular order as indicated by the figures.

94. Even after the time and tune have been thus so fully gone into, it will still be necessary to pattern the rhythm and tonal phrasing again. When this has been done and the song sung as a whole to the solfa names, the words should be recited and their meaning discussed, and attention should be given to details of pronunciation. In fitting words to the music care must be taken from the first to see that the sense is not obscured by wrong connections of words and syllables. The eleventh bar of the above song presents a typical difficulty. In every other case of a bar with this rhythm the sense of the words allows breath to be taken between the dotted crotchet and the quaver, thus :

but clearly this will not do for the eleventh bar



It may be too much to expect this point to be thoroughly mastered in a children's class. If the class is over worried with it they will lose all liking and interest in the piece. The discretion of the teacher must decide to what extent faults of this kind are to be tolerated. A song taught as suggested should be regarded as a complete lesson in time and tune, and not simply thrown in at the end of a lesson consisting of comparatively unmusical exercises and begun when the class is tired.

Round singing, part singing, voice training, and expression must be deferred to the next number.

The 1891 Scholarship Examination.

BY DR. GEORGE BEACH, M.A.

Co-Author of 'A Manual of our Mother-Tongue,'

Author of 'Elements of English,' 'Entertaining Readers.'

As less than six months now intervene between the present time and the next Scholarship Examination, as the number of failures is always considerable, and as the fortunate ones obtaining admittance to Training Colleges are always many fewer than those placed in the First and Second Classes, it behoves every Fourth Year Pupil Teacher to throw aside every weight and gird his loins for the race set before him.

What now are the circumstances requisite in order to secure an ordinary amount of success?

They may roughly be classified as (A) PERSONAL and (B) EXTERNAL.

These again may be subdivided into :—

(A) PERSONAL.
(1) *Health;* (2) *Industry;* (3) *Methodical Habits;* (4) *Will;* (5) *Ability.*

(B) EXTERNAL.
(1) *Leisure;* (2) *Books;* (3) *Tuition;* (4) *Educational Atmosphere.*

(A 1) *Health.*—A sound mind may reside in an unsound body, but where ill-health is the normal condition, it goes without saying, that the mental energies must be correspondingly decreased and much enjoyment and opportunities of usefulness and progress must inevitably be lost.

No person who values his mind will undervalue his body. If we ignore the mysterious wedlock between our corporeal and mental systems, and consider the body but as the envelope and the seat of the mind, amidst material environments, it is still just as unwise to neglect our mind's house as it is to neglect our dwellings. Yes, and more foolish, for we cannot change our earthly tabernacles as we can our houses.

Every Scholarship Candidate should therefore strive after perfect bodily health and vigour by means of regular and not too exhausting exercise, by systematic habits and avoidance of excess, by plain and nourishing diet and sanitary surroundings.

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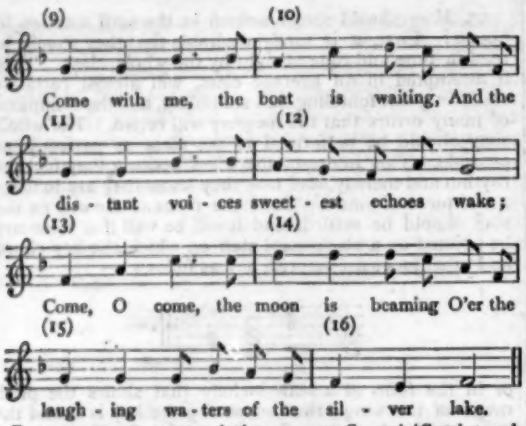
☞ Miss Scott's Scholarship Answers will be resumed next week.


(9)
(10)
Come with me, the boat is waiting, And the
(11)
(12)
dis - tant voi - ces sweet - est echoes wake;
(13)
(14)
Come, O come, the moon is beaming O'er the
(15)
(16)
laugh - ing wa - ters of the sil - ver lake.

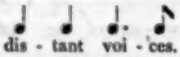
For two-part arrangement and other verses, see Curwen's 'Crotchets and Quavers.' Part II. Price 3d.

the analysis on the blackboard will be as follows :—

and it will be plainly seen that there are only four varieties of bar-filling throughout the tune. Of course, the pupils themselves should discover these varieties and their repetitions. The above analysis should then be used as a time exercise, sung on a monotone to time-names or to laa, sometimes straight through as written, and sometimes in irregular order as indicated by the figures.

94. Even after the time and tune have been thus so fully gone into, it will still be necessary to pattern the rhythm and tonal phrasing again. When this has been done and the song sung as a whole to the solfa names, the words should be recited and their meaning discussed, and attention should be given to details of pronunciation. In fitting words to the music care must be taken from the first to see that the sense is not obscured by wrong connections of words and syllables. The eleventh bar of the above song presents a typical difficulty. In every other case of a bar with this rhythm the sense of the words allows breath to be taken between the dotted crotchet and the quaver, thus :

but clearly this will not do for the eleventh bar



It may be too much to expect this point to be thoroughly mastered in a children's class. If the class is over worried with it they will lose all liking and interest in the piece. The discretion of the teacher must decide to what extent faults of this kind are to be tolerated. A song taught as suggested should be regarded as a complete lesson in time and tune, and not simply thrown in at the end of a lesson consisting of comparatively unmusical exercises and begun when the class is tired.

Round singing, part singing, voice training, and expression must be deferred to the next number.

The 1891 Scholarship Examination.

BY DR. GEORGE BEACH, M.A.

Co-Author of 'A Manual of our Mother-Tongue,'

Author of 'Elements of English,' 'Entertaining Readers.'

As less than six months now intervene between the present time and the next Scholarship Examination, as the number of failures is always considerable, and as the fortunate ones obtaining admittance to Training Colleges are always many fewer than those placed in the First and Second Classes, it behoves every Fourth Year Pupil Teacher to throw aside every weight and gird his loins for the race set before him.

What now are the circumstances requisite in order to secure an ordinary amount of success?

They may roughly be classified as (A) PERSONAL and (B) EXTERNAL.

These again may be subdivided into :—

(A) PERSONAL.
(1) *Health;* (2) *Industry;* (3) *Methodical Habits;* (4) *Will;* (5) *Ability.*

(B) EXTERNAL.
(1) *Leisure;* (2) *Books;* (3) *Tuition;* (4) *Educational Atmosphere.*

(A 1) *Health.*—A sound mind may reside in an unsound body, but where ill-health is the normal condition, it goes without saying, that the mental energies must be correspondingly decreased and much enjoyment and opportunities of usefulness and progress must inevitably be lost.

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These books procured and mastered, the candidate may defy the Scholarship Examiner and all his questions.

(B 3) *Tuition.*—Personal tuition is doubtless far the best, if it can be obtained from a professional 'COACH,' but if not the pupil teacher should place himself in connection with our TRAINING CLASSES, because his head teacher, under the present system, cannot afford to spend the thought, time and care over a single pupil as must necessarily be spent under our system; neither can the ordinary teacher have that technical knowledge of the Scholarship Examination which the EXPERIENCED 'COACHES' have whom we have secured.

Another very important point is, that in an Examination *not viva voce*, personal tuition has not that advantage over correspondential tuition which it would otherwise have; and the latter being conducted in writing, the pupil is trained in the art of answering, a point often neglected in the other system.

We shall also be able to inform the pupil as to his (or her) probable chances of success, a factor of no small moment, as no one will be allowed to fail more than twice.

(B 4) *Educational atmosphere.*—This is a surround ng of no small importance, particularly as regards rural and country teachers. It is easy to be a triton among minnows, and the one-eyed is king among the blind. By joining our classes, the candidate will be able better to realise his true position, and will probably be taught to aim higher than he would have done had he remained isolated.

(To be continued.)

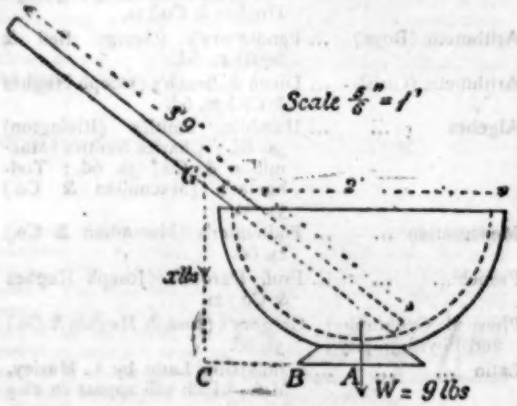
Query Column.

General.

1. FERN.—In a decimal system there would be no need of practice rule, as these sums would be done by multiplication of decimals, the money being convertible at once to the decimal of a pound, and the quantity (if compound practice) to the decimal of the quantity the price of which is given.

2. BOWL.—A hemispherical bowl with flat foot as shown weighs 9 lbs., and a uniform rod rests in the bowl in the position indicated. Assuming that the foot of the rod does not slip in the bowl, find the greatest permissible weight per lineal foot of the rod that it may not overturn the bowl.

(*Science and Art Geometry*, 1890).



Let x lbs. = the required weight of the whole rod.

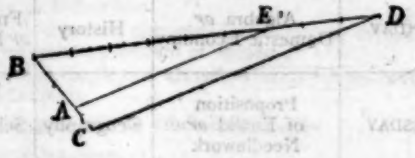
The bowl will evidently tend to turn about the point B. Find G the middle point of the rod. This being its centre of gravity, its weight will act vertically through G. Draw GC vertically to meet the foot of the bowl continued in C. The weight of the bowl itself acts downwards through the middle of the foot A. Now, when the weight of the rod is such that it is just on the point of upsetting the bowl, the moments of the weights of the rod and bowl about the point B must balance each other.

$\therefore$ Weight of bowl $\times$ AB $= x \times$ BC.

or AB : BC :: x : W. (1)

In the figure below, set out from a point B, lengths BA, BC equal to BA, BC in the above figure.

Also from B draw in any direction a line BD to represent the weight of the bowl, on some scale (say $\frac{1}{4}$" to 1 lb.) Join CD and through A draw AE parallel to CD.



Then, from similar triangles, we have

BA : BC :: BE : BD.

i.e., BA : BC :: BE : W. (2)

Comparing (2) with (1) we see that BE represents the required weight of the whole rod on the same scale as BD represents the weight of the bowl.

If this length BE be now divided by the number of feet in the length of the rod, the resulting length (in quarter inches) will give the greatest permissible weight per foot of the rod. This can easily be done geometrically by drawing a line equal to four times the length of BE and taking $\frac{1}{12}$th of such line.

Arithmetic.

1. F. S.—Two recurring decimals are added together; prove that the number of digits in the period of the result cannot exceed the product of the numbers of the digits in the original periods.

(*Oxford and Cambridge School Exam.* 1886.)

After a decimal has begun to repeat, the repetition may be supposed to begin at any subsequent figure, and that a period of 2 figures is the same as one of 4, 6, 8, &c., figures, thus $\cdot\dot{4}\dot{5}$ is the same as $\cdot 4545\dot{4}\dot{5}$, $\cdot 45454\dot{5}\dot{4}\dot{5}$, &c., and that a period of 3 figures is the same as one of 6, 9, 12, &c., figures; hence if two recurring decimals have to be added, and one period consists of 2 figures and the other of 3 figures, we may consider each of them to consist of a period of 6 figures, where 6 is the L.C.M. of 2 and 3, and as the whole body of figures within these 6 places will constantly be repeated, their sum will be constantly repeated.

$\therefore$ Number of digits in the recurring part of the sum is the L.C.M. of the numbers of digits in the two decimals, and therefore cannot exceed their product.

2. TATOR.—A square foot of sheet copper $\frac{1}{12}$ in. thickness weighs 1·45 lbs. and a similar sheet of lead weighs 1·85 lbs.; how wide a strip must be cut from the lead, so that, when it is added to the copper, they shall together weigh as much as the remainder of the lead? (*Donkin's Arithmetic.*)

Weight of lead per inch in width $= \frac{1\cdot 85}{12}$ lb.

1·45 lbs. + weight added to the copper = 1·85 lbs. − weight added to the copper

Twice weight added to the copper = 1·85 lbs. − 1·45 lbs.

= ·4 lb.

$\therefore$ Weight added to the copper = ·2 lb.

$\therefore$ Width to be cut off $= \left(\cdot 2 \text{ lb.} \div \frac{1\cdot 85}{12} \text{ lb.}\right)$ in.

$= \frac{2\cdot 4}{1\cdot 85}$ in.

$= \frac{240}{185}$ in.

$= \frac{48}{37}$ in.

$= 1\frac{11}{37}$ in. Ans.

7. What governs the object in a sentence?
8. What governs the indirect object?
9. What is meant by *extension* in a sentence?
10. What is the predicate in the sentence—John became a man.
11. Why is this so?
12. What case is man?

STANDARD VI.

Arithmetic.—Boys only:—

1. Find simple interest on £2,187½ for 219 days at 4½ per cent. per annum. £59 1s. 3d.
2. £26 is ·325 of a certain sum of money. What is the whole sum? £80.
3. From the sum of ⅔ of 21s., ¾ of 20s., and ⅕ of 5s. take the sum of ⅔ of ⅔ of 20s. and $\frac{1}{12}$ of 1s. 5s. 5½d.
4. Divide 20s. among A, B and C, giving A a fourth as much again as C, and B three times as much as A.
Ans. 4s. 2d.; 12s. 6d.; 3s. 4d.

Arithmetic.—Girls only.

1. If 15¾ yards cost £2 15s. 1½d., what will 13½ yards cost?
Ans. £2 7s. 3d.
2. Find simple interest on £3,790 18s. 4d. for 10½ years at 7½ per cent. per annum. Ans. £2,985 6s. 11½d.
3. What is the difference between ·009 × ·23 and ·00207 ÷ ·009? Ans. ·22793.
4. A man bought 5280 oranges, but $\frac{1}{10}$ were bad. For how much were the good oranges sold at the rate of 16 for a shilling?
Ans. £7 8s. 6d.

Composition.—Write a letter upon one of the following subjects:—

1. A winter's day.
2. Birds.
3. Covering of animals.
4. A postage stamp.
5. The seasons.
6. Useful metals.

STANDARDS VI. AND VII.

Grammar.—

1. Analyse and parse:—I dare do all that may become a man.
2. What is a complex sentence?
3. What is a principal sentence?
4. What is a subordinate sentence?
5. How can you tell a subordinate sentence?
6. How many kinds of subordinate sentences are there?
7. Give an illustration of each.
8. How is the possessive case formed?
9. What are the possessive pronouns?
10. What is meant by number?
11. What parts of speech have number?
12. How is the plural of nouns formed?

STANDARD VII.

Arithmetic.—Boys only:—

1. A town contained 6,500 electors. Of these 3,250 voted for one candidate and 2,500 for the other. What percentage of the electors did not vote? Ans. 11⅓ per cent.
2. Find the compound interest on £1,000 for two years at 5 per cent. per annum. Ans. £102 10s.
3. How long will A and B, working together, take to do a piece of work if A alone can do it in 4 days, and B alone can do it in 6 days? Ans. 2½ days.
4. A man sold 600 oranges at 10 for a shilling, 750 oranges at 25 for 2s. 6d., and 250 oranges at 5 for 6d. What was the average price per score? Ans. 2s.

Arithmetic.—Girls only:—

1. I bought 17 chairs for £12 10s. 9d. Six of them cost 17s. 0½d each. What was the average price of the others?
Ans. 13s. 6d.
2. A man buys goods for £23 5s. 5d., and sells them for £22 2s. 1½d. What does he lose per cent.? Ans. 5 per cent.
3. If 25 chickens, each weighing 3 lbs. 6 ozs., cost £2 14s. 0d., what should be the price of 30 chickens each weighing 4 lbs. 11 ozs. each? Ans. £4 10s. 0d.
4. If 28 men or 32 boys can do a piece of work in 54 days, in what time will 14 men and 11 boys do it? Ans. 64 days.

STANDARDS V. VI. AND VII.

Geography:—Europe.

1. Draw a map of the
(*a*) Rhine basin.
(*b*) Iberian peninsula.
(*c*) Baltic sea.
2. In which direction do the great European peninsulas run?
3. Name them.
4. Mention one that runs north.
5. What countries form the Iberian peninsula?
6. What mountains separate it from France?
7. Name the highest peak in them?
8. Name three places of historical interest in this peninsula.
9. What important fortress is at the south?
10. To what sea does it lead?
11. Name the five chief rivers in this peninsula.
12. Where are St. Vincent, Trafalgar, and Corunna?
13. Why are they famous?
14. Name the chief product of these countries.
15. What are the two chief wines manufactured here?
16. Where are Barcelona, Valencia, Oporto, Toledo, Tarragona, and Malaga?
17. For what is each famous?
18. Where are Lisbon and Madrid?

Tote for Standards V.—VII.:—

£	s.	d.	£	s.	d.
709,428	19	10	498,061	19	7
93,612	17	8	232,908	17	5
437,109	18	5	74,197	16	7
998,436	17	7	849,653	15	9
78,497	16	9	79,128	17	4
818,796	15	7	257,809	18	11
76,538	14	6	78,650	19	8
835,678	13	5	909,846	15	9
91,987	17	3	657,328	13	7
838,145	18	9	89,797	14	5
£	s.	d.	£	s.	d.
749,839	19	10	948,916	16	6
89,487	17	5	78,714	17	7
384,989	15	9	456,643	15	9
172,195	14	7	171,846	14	8
89,987	17	4	796,148	18	5
635,418	15	9	155,819	19	10
493,280	18	7	798,716	16	7
98,432	16	5	849,872	12	2
499,838	14	8	456,797	17	8
556,654	18	11	897,423	15	11

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